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**From:** Johnson, Ray (CONTR) [Ray.Johnson@lm.doe.gov]  
**Sent:** 1/16/2015 5:29:32 PM  
**To:** Shea, Valois [Shea.Valois@epa.gov]  
**Subject:** RE: updated journal article - couldn't find attachment  
**Attachments:** Fig 1 generic uranium roll front.pptx; Fig 2 generic ISR process.pptx; Fig 3 site location.pptx; Fig 4 oxidized zone.pptx; Fig 5 model setup.pptx; Fig 6 sample variability best calibrations.pptx; Fig 7 sample variability plus calcite equil.pptx; Fig 8 11-14C-4 with pH change.pptx; Fig 9 restored and background change.pptx; predictions paper7.docx

The attachment was a zip folder, so maybe it did not go through. Attached are all the files, non-zipped.

Ray

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**From:** Shea, Valois [mailto:Shea.Valois@epa.gov]  
**Sent:** Friday, January 16, 2015 9:30 AM  
**To:** Johnson, Ray (CONTR)  
**Subject:** RE: updated journal article - couldn't find attachment

Hi Ray,

I don't see the attachment in the email you sent. Could you resend it please?

Thanks!

*Valois*

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Valois Shea  
U.S. EPA Region 8  
MailCode: 8P-W-UIC  
1595 Wynkoop Street  
Denver, CO 80202-1129  
Phone: (303) 312-6276  
Fax: (303) 312-6741  
Email: [shea.valois@epa.gov](mailto:shea.valois@epa.gov)

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**From:** Johnson, Ray (CONTR) [mailto:Ray.Johnson@lm.doe.gov]  
**Sent:** Thursday, January 15, 2015 4:23 PM  
**To:** Shea, Valois  
**Subject:** updated journal article

Hi Valois,

Updated journal article is attached.

I had a thought on the pore volume issue. Maybe just say "a column study with a pore volume equivalent to X number of years in the field for flow across the mine unit". That would allow leeway in the column study design vs. the field groundwater flow rate. For the columns we ran, a 100 year equivalent was about 40 pore volumes (rough estimate). This approach does not really account for any rate limiting things, but trying to spell out details to get into rate limitations would be really complicated.

Ray

Raymond H. Johnson, Ph.D.  
Geochemist/hydrogeologist  
Stoller Newport News Nuclear (SN3)  
A Subsidiary of Huntington Ingalls Industries  
Contractor to the U.S. Department of Energy  
Office of Legacy Management  
2597 Legacy Way  
Grand Junction, CO 81503-1789  
970-248-6468  
[Ray.Johnson@lm.doe.gov](mailto:Ray.Johnson@lm.doe.gov)



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